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Brian E. Jones

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EXAMINER

CHOWDHURY, IQBAL HOSSAIN

ART UNIT

PAPER NUMBER

1652

MAIL DATE

DELIVERY MODE

11/16/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/549,943

Applicant(s)

JONES ET AL.

Examiner

Iqbal H. Chowdhury, Ph.D.

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1652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 August 2007.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 22-24, 29 and 31-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21, 25-28 and 30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>07/07</u>   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

This application is a 371 of PCT/US04/13258.

Claims 1-33 are currently pending.

Applicant's election with traverse of Group 1, Claims 1-21, 25-28 and 30, drawn to an isolated polynucleotide encoding a polypeptide cellulase, expression construct, vector, host cell and process for producing polypeptide, polypeptide cellulase and a method of treating wood pulp by using said cellulase in the response filed on 8/17/2007 is acknowledged.

The traversal is on the ground(s) that there would be no burden of search for the coexamination of all the groups I-VII simultaneously. This is not found persuasive because while the search necessary for examination of all the groups overlaps it is not coextensive, examination of Group II-VII would require search of subclasses unnecessary for the search of Group I. As restriction is clearly permissible even among related inventions as defined in MPEP 808 and 35 U.S.C. 121 allows restriction of inventions, which are independent or distinct.

Regarding rejoining of non-elected claims, which are use of the elected product claims, applicants request for rejoinder is noted. However, current claims of elected Group claims 1-28 and 30 are not allowable at this time. When claims 1-28 and 30 would be allowable; rejoinder request would be evaluated at that time.

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The requirement is still deemed proper and is therefore made FINAL.

Claims 22-24, 29 and 31-33 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Claims 1-21, 25-28 and 30 are under consideration and are being examined herein.

***Priority***

Acknowledgement is made of applicants claim for priority of provisional application 60/466,831 filed on 04/29/2003.

***Information Disclosure Statement***

The information disclosure statement (IDS) submitted on 7/26/2007 is acknowledged. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is considered by the examiner. The signed copy of IDS is enclosed herewith.

***Drawings***

Drawings submitted on 9/20/2005 are accepted by the Examiner.

***Non-compliance of Sequence Rule***

Applicant is required to comply with the sequence rules by inserting the sequence identification numbers of all sequences recited within the claims and/or specification. It is particularly noted that Claim 7 recites "a probe designed to hybridize with the nucleotide sequence disclosed in Figure 2 without a corresponding sequence identifier recited. See particularly 37 CFR 1.821(d).

***Claim Objections***

Claims 1-3 are objected to as encompassing non-elected subject matter. Appropriate correction is required.

Claims 1, 10 and 15-16 are objected to in the recitation "029cel" as abbreviations should not be used without at least once fully setting forth what they are used for. "Appropriate correction is required.

Claim 1 is objected to in the recitation "85% sequence identity to presented as SEQ ID NO: 1", which should be "85% sequence identity to SEQ ID NO: 1". Appropriate correction is requested.

Claim 7 is objected to in the recitation "matrix..", which should be "matrix.". Appropriate correction is requested.

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Claim 2 is objected to in the recitation "0.1 SSPE", which should be "0.1 X SSPE". Appropriate correction is requested.

Claim 16 is objected to in the recitation "The substantially purified", which should be "A substantially purified". Appropriate correction is requested.

Claim 10 is objected to in the recitation "a polynucleotide sequence", which should be "the polynucleotide sequence". Appropriate correction is requested.

Claim 16 is objected to in the recitation "or a derivative is provided which is obtainable" which should be "or a derivative which is obtainable". Appropriate correction is requested.

Claim 3 is objected to in the recitation "isolated nucleotide --- wherein the nucleotide", which should be "isolated polynucleotide --- wherein the polynucleotide". Appropriate correction is requested.

Claim 8 is objected to in the recitation "A expression vector" which should be "An expression vector". Appropriate correction is requested.

Claim 9 is objected to in the recitation "A expression vector" which should be "An expression vector". Appropriate correction is requested.

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***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1, 7 and 23 recite either "a complement thereof" or "complimentary to", which are unclear as to whether it is limited to either "full-length complement" or "fully complementary" or includes partial complements. Accordingly, claims 2-6, and 8-14 are rejected, as they depend on claims 1 directly or indirectly. For purpose of the further examination, Examiner has concluded that claim encompass both full length or fully complementary and partial compliments or partial complementary.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites both coding sequence and complements as a group encoding a cellulase, which is confusing because the complements do not encode anything.

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Accordingly, claims 2-6, and 8-14 are rejected, as they depend on claims 1 directly or indirectly.

Claims 9 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 is indefinite and vague in the recitation of the "control sequence". Does "control sequence" mean control regulatory sequence or something else? Accordingly, claim 10 is rejected as claim 10 depends on claim 9.

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the present instance, claim 7 recites the phrase "under intermediate to high stringency", but the specification does not define what conditions constitute "intermediate to high stringency". While page 11 attempts to describe an intermediate to high stringent condition, the description is merely exemplary and not a clear definition. In the art the meaning of the term "stringent" varies widely depending on the individual situation and the person making the determination. Therefore, it is not clear to the Examiner as to



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what hybridization conditions are encompassed in the above phrase.

Claim 16 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 16 recites "a derivative", which is confusing as to the scope of the 029cel cellulase polypeptide. It is not clear whether this phrase includes structural derivative of the 029cel cellulase polypeptide having functional activity or not.

Claims 15-16 and 30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite and vague for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 15 and 16 are indefinite and vague in the recitation of the "substantially purified" as it is unclear how purified of a polypeptide must be to be encompassed by the phrase "substantially purified". Accordingly, claim 30 is also rejected as it depends on claim 15.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

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The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-14 and 16-21 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 1-2, 7 and 16 are directed to any polynucleotide comprising any complement of SEQ ID NO: 1 or 2, which includes fragments of SEQ ID NO: 1 or (even 2 nucleotides fragment) (claims 1, 2 and 7), which encodes a protein having cellulase activity or any polynucleotide which hybridizes to any fragments of SEQ ID NO: 1 (claims 1 and 7) or any derivative of cellulase which is obtainable from a *Bacillus* (claim 16). Claim 3 recites the polynucleotide, wherein the polynucleotide is selected from the group mRNA, DNA, cDNA, or genomic DNA and claim 4 recites the polynucleotide, wherein said polynucleotide is an RNA molecule. Claim 5 recites the polynucleotide encoding an enzyme having cellulase activity, wherein the enzyme is isolated from a *Trichoderma* source and claim 6 recites the polynucleotide, wherein the encoding enzyme is isolated from *Trichoderma reesei*. Claims 8 and 9 recite an expression vector comprising the polynucleotide, wherein the polynucleotide is operably linked to control sequences recognized by a host cell transformed with the vector and claim 10 recites an expression vector comprising a regulatory polynucleotide sequence including a promoter sequence derived from a glucose isomerase gene of

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Actinoplanes, a signal sequence derived from a *Streptomyces* cellulase gene, and a polynucleotide sequence encoding a 029cel cellulase. Claim 11 recites a vector comprising the expression construct of Claim 8 and claim 12 recites a host cell transformed with the vector of Claim 8. Claim 13 recites the host cell of Claim 12, which is a prokaryotic cell and claim 14 recites the host cell of Claim 12, which is a eukaryotic cell. Claim 17 recites a method of producing a cellulase comprising the steps of (a) culturing the host cell according to claim 12 in a suitable culture medium under suitable conditions to produce the cellulase; and (b) obtaining said produced cellulase. Claim 18 recites the method of Claim 17, wherein the host cell is a filamentous fungi or yeast cell and claim 19 recites the method of Claim 17, wherein the host cell is a bacterium. Claim 20 recites the method of Claim 19 wherein the bacterium is a *Streptomyces* and claim 21 recites a purified enzyme having cellulase activity prepared by the method of Claim 17.

The specification does not contain any disclosure of the structures of all DNA comprising fragments of SEQ ID NO: 1 or 2 or which will hybridize to any fragments of SEQ ID NO: 1 or which is a derivative of a cellulase obtained from *Bacillus*. Therefore, many structurally unrelated DNAs are encompassed within the scope of these claims, including partial DNA sequences. The specification does not also contain any disclosure of the structures of all derivatives of said cellulase. The specification discloses only two representative species of the claimed genus (DNA) i.e. SEQ ID NO: 1 and 2 and

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single representative species of cellulase polypeptide (i.e. SEQ ID NO: 3), which is insufficient to put one of skill in the art in possession of the attributes and features of all species within the claimed genus. Therefore, one skilled in the art cannot reasonably conclude that the applicant had possession of the claimed invention at the time the instant application was filed.

Applicant is referred to the revised guidelines concerning compliance with the written description requirement of U.S.C. 112, first paragraph, published in the Official Gazette and also available at [www.uspto.gov](http://www.uspto.gov).

Claims 1-21, 25-28 and 30 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a nucleic acid sequence of SEQ ID NO: 1 or 2 encoding polypeptide of SEQ ID NO: 3 having cellulase activity isolated from *Bacillus agaradhaerens*, an expression vector, transformed host cell comprising said nucleic acid sequence, a detergent composition comprising said polypeptide and a method of treating wood pulp with said cellulase polypeptide, does not reasonably provide enablement for any nucleic acid sequence which is 85% identical to SEQ ID NO: 1 or 2 or any nucleic acid sequence which is complementary to any region of SEQ ID NO: 1 or 2 or

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any nucleic acid sequence which hybridizes under intermediate stringency conditions to SEQ ID NO: 1 or 2 or any fragments thereof or any polypeptide encoded by SEQ ID NO: 1 or 2, which is 85-90% identical to SEQ ID NO: 3 or any derivative thereof. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

Claims 1-21, 25-28 and 30 are so broad as to encompass any nucleic acid sequence which is 85% identical to SEQ ID NO: 1 or 2 or any nucleic acid sequence which is complementary to any region of SEQ ID NO: 1 or 2 or any nucleic acid sequence which hybridizes under intermediate stringency conditions to SEQ ID NO: 1 or 2 or any fragments thereof or any polypeptide encoded by SEQ ID NO: 1 or 2, which is 85-90% identical to SEQ ID NO: 3 or any derivative thereof.

The scope of the claims are not commensurate with the enablement provided by the disclosure with regard to the extremely large number of cellulase gene encoding cellulase protein including many mutants and fragments and variants broadly encompassed by the claims. Since the nucleotide sequence of polynucleotide determines the encoded amino acid sequence of a protein which in turn determines structural and functional

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properties of said encoded proteins, predictability of which changes can be tolerated in said nucleotide sequence and in turn in the encoded a protein's amino acid sequence and obtain the desired activity requires a knowledge of and guidance with regard to which nucleotide affect what which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expectedly intolerant to modification), and detailed knowledge of the ways in which the proteins' structure relates to its function. However, in this case the disclosure is limited to the nucleotide and encoded amino acid sequence of only two nucleic acid sequences and a single amino acid sequence having cellulase activity to make the composition and used for treating wood pulp.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen for multiple substitutions or multiple modifications, as encompassed by the instant claims, and the positions within a protein's sequence where amino acid modifications can be made with a reasonable expectation of success in obtaining the desired activity/utility are limited in any protein and the result of such modifications is unpredictable (Whisstock et al. 2003). In addition, one skilled in the art would expect any tolerance to modification for a given protein to diminish with each further and additional

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modification, e.g. multiple point mutations or substitutions.

The specification does not support the broad scope of the claims which encompass any nucleic acid sequence which is 85% identical to SEQ ID NO: 1 or 2 or any nucleic acid sequence which is complementary to any region of SEQ ID NO: 1 or 2 or any nucleic acid sequence which hybridizes under intermediate stringency conditions to SEQ ID NO: 1 or 2 or any fragments thereof or any polypeptide encoded by SEQ ID NO: 1 or 2, which is 85-90% identical to SEQ ID NO: 3 or any derivative thereof because the specification does not establish: (A) regions of the protein structure which may be modified without affecting cellulase enzyme activity; (B) the general tolerance of cellulase polypeptides to modification and extent of such tolerance; (C) a rational and predictable scheme for modifying any amino acid residue in cellulase polypeptide with an expectation of obtaining the desired biological function; and (D) the specification provides insufficient guidance as to which of the essentially infinite possible choices is likely to be successful.

Thus, applicants have not provided sufficient guidance to enable one of ordinary skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any nucleic acid sequence

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which is 85% identical to SEQ ID NO: 1 or 2 or any nucleic acid sequence which is complementary to any region of SEQ ID NO: 1 or 2 or any nucleic acid sequence which hybridizes under intermediate stringency conditions to SEQ ID NO: 1 or 2 or any fragments thereof or any polypeptide encoded by SEQ ID NO: 1 or 2, which is 85-90% identical to SEQ ID NO: 3 or any derivative thereof. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970)). Without sufficient guidance, determination of any nucleic acid sequence which is 85% identical to SEQ ID NO: 1 or 2 or any nucleic acid sequence which is complementary to any region of SEQ ID NO: 1 or 2 or any nucleic acid sequence which hybridizes under intermediate stringency conditions to SEQ ID NO: 1 or 2 or any fragments thereof or any polypeptide encoded by SEQ ID NO: 1 or 2, which is 85-90% identical to SEQ ID NO: 3 or any derivative thereof having the desired biological characteristics is unpredictable and the experimentation left to those skilled in the art is unnecessarily, and improperly, extensive and undue. See In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under



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this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 16 is rejected under 35 U.S.C. 102(b) as being anticipated by Shirai et al. (Crystal structure of alkaline cellulase K: insight into the alkaline adaptation of an industrial enzyme.

J Mol Biol. 2001 Jul 27; 310(5): 1079-87). Instant claim is directed to a substantially purified cellulase or a derivative isolated from Bacillus. Shirai et al. disclose a cellulase isolated from Bacillus agaradhaerens. Shirai et al. also disclose purified said cellulase and its crystal structure. Therefore, Shirai et al. anticipate claim 16 of the instant application.

Claim 15 is rejected under 35 U.S.C. 102(b) as being anticipated by Ahsan et al. (Cloning, DNA sequencing, and expression of the gene encoding Clostridium thermocellum cellulase CelJ, the largest catalytic component of the cellulosome,

J Bacteriol. 1996 Oct;178(19):5732-40). Instant claim is directed to a substantially purified cellulase or an active fragment of SEQ ID NO: 3. Ahsan et al. disclose a cellulase,

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which is 26.2% identical to SEQ ID NO: 3 (see attached sequence alignment) having cellulase activity. Ahsan et al. also disclose purification of said cellulase. Therefore, Ahsan et al. anticipate claim 15 of the instant application.

Claims 1, 2 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by GenBank Accession No. L20094 (Thermomonospora fusca beta-1,4-endoglucanase precursor (E1) gene, complete cds. Created 3/25/1998). Instant claims are directed to any polynucleotide comprising any complement of SEQ ID NO: 1 or 2, which includes fragments of SEQ ID NO: 1 or (even 2 nucleotides fragment) (claims 1, 2 and 7), which encodes a protein having cellulase activity or any polynucleotide which hybridizes to any fragments of SEQ ID NO: 1. GenBank Accession No. L20094 disclose a Thermomonospora fusca beta-1,4-endoglucanase precursor (E1) gene, encoding a cellulase cellulose binding domain, which is 48.4% identical to SEQ ID NO: 2 of the instant application (best local similarity from nucleotide 707-1151 of the instant application). Since, the scope of the claim includes any complement of SEQ ID NO: 2 or any fragment of SEQ ID NO: 2 would hybridizes with SEQ ID NO: 2, therefore, the nucleic acid sequence of Thermomonospora fusca beta-1,4-endoglucanase precursor (E1) gene, is within the scope of the instant application which would be any complement of SEQ ID NO: 2 and would hybridizes with SEQ ID NO: 2 as a fragment of SEQ ID NO: 2 of the instant application. Therefore, GenBank Accession No. L20094 anticipates claims 1, 2 and 7 of the instant application as written.

Claims 1-4, 7-9, 11-13, 17, 19-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Jung et al. (DNA sequences and expression in Streptomyces lividans of an

exoglucanase gene and an endoglucanase gene from *Thermomonospora fusca*. Appl Environ Microbiol. 1993 Sep;59(9):3032-43). Instant claims are directed to any polynucleotide comprising any complement of SEQ ID NO: 1 or 2, which includes fragments of SEQ ID NO: 1 or (even 2 nucleotides fragment) (claims 1, 2 and 7), which encodes a protein having cellulase activity or any polynucleotide which hybridizes to any fragments of SEQ ID NO: 1, wherein the nucleic molecule is a DNA or RNA, an expression vector, a host cell transformed with said nucleic acid molecule, wherein the host cell is prokaryotic cell such *Streptomyces*, a method of producing said cellulase and purification of said cellulase enzyme. Jung et al. disclose a *Thermomonospora fusca* beta-1,4-endoglucanase precursor (E1) gene, encoding a cellulase cellulose binding domain, which is 48.4% identical to SEQ ID NO: 2 of the instant application (best local similarity from nucleotide 707-1151 of the instant application). Jung et al. also disclose a DNA and RNA molecule, an expression vector and a transformed host cell, wherein the host cell *Streptomyces*. Jung et al. further disclose a method of producing said cellulase protein and purified. Since, the scope of the claim includes any complement of SEQ ID NO: 2 or any fragment of SEQ ID NO: 2 would hybridizes with SEQ ID NO: 2, therefore, the nucleic acid sequence of *Thermomonospora fusca* beta-1,4-endoglucanase precursor (E1) gene, is within the scope of the instant application which would be any complement of SEQ ID NO: 2 and would hybridizes with SEQ ID NO: 2 as a fragment of SEQ ID NO: 2 of the instant application. Therefore, Jung et al. anticipates claims 1-5, 7-9, 11-13 17, 19-21 of the instant application as written.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 5-6, 14 and 18 are ejected under 35 U.S.C. 103(a) as being unpatentable over Jung et al. (DNA sequences and expression in *Streptomyces lividans* of an exoglucanase gene and an endoglucanase gene from *Thermomonospora fusca*. Appl Environ Microbiol. 1993 Sep;59(9):3032-43) as applied to claims 1-5, 7-9, 11-13, 17, and 19-21, and further in view of Godbole et al. (Cloning and expression of *Trichoderma reesei* cellobiohydrolase I in *Pichia pastoris*, Biotechnol Prog. 1999 Sep-Oct;15(5):828-

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33). Instant claims are directed to any polynucleotide comprising any complement of SEQ ID NO: 1 or 2, which includes fragments of SEQ ID NO: 1 or (even 2 nucleotides fragment), which encodes a protein having cellulase activity, wherein the nucleic molecule is isolated from *Trichoderma reesei*, an expression vector, a host cell transformed with said nucleic acid molecule, wherein the host cell is a eukaryotic cell, a method of producing said cellulase in yeast cell.

Jung et al. teach a *Thermomonospora fusca* beta-1,4-endoglucanase precursor (E1) gene, encoding a cellulase having a cellulose binding domain, which is 48.4% identical to SEQ ID NO: 2 of the instant application (best local similarity from nucleotide 707-1151 of the instant application). Jung et al. also disclose a DNA and RNA molecule, an expression vector and a transformed host cell, wherein the host cell *Streptomyces*. Jung et al. further disclose a method of producing said cellulase protein and purified. Since, the scope of the claim includes any complement of SEQ ID NO: 2 or any fragment of SEQ ID NO: 2 would hybridizes with SEQ ID NO: 2, therefore, the nucleic acid sequence of *Thermomonospora fusca* beta-1,4-endoglucanase precursor (E1) gene, is within the scope of the instant application which would be any complement of SEQ ID NO: 2 and would hybridizes with SEQ ID NO: 2 as a fragment of SEQ ID NO: 2

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of the instant application. Jung et al. do not teach the isolation of the cellulase gene from *Trichoderma reesei* and express in a eukaryotic yeast cell.

Godbole et al. teach cloning and expression of a cellobiohydrolase, a cellulase from *Trichoderma reesei* and cloning and expression of said gene in a yeast cell *Pichia pastoris* and purified said cellulase protein.

By combining the teachings of Jung et al. and Godbole et al. it would have been obvious to one of ordinary skill in the art at the time of the invention was made to use the cellulase gene from *Trichoderma reesei* of Godbole et al. in a method of Jung et al. express said cellulase gene in eukaryotic yeast host cell *Pichia pastoris* for producing said cellulase as taught by Godbole et al.

One of ordinary skill in the art would have been motivated to express said cellulase gene in eukaryotic yeast cell such as *Pichia pastoris* in order to produce a protein having glycosylation, which is not possible in a prokaryotic cell such as in bacteria.

One of ordinary skill in the art would have a reasonable expectation of success because Godbole et al. could successfully produce said cellulose protein in said eukaryotic *Pichia pastoris* cells.

Therefore, claims 5-6, 14 and 18 would have been *prima facie* obvious to use one of ordinary skill in the art.

### ***Conclusion***

**Status of the claims:**

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Claims 1-33 are pending.

Claims 22-24, 29, and 31-33 are withdrawn.

Claims 1-21, 25-28 and 30 are rejected.

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Iqbal Chowdhury whose telephone number is 571-272-8137. The examiner can normally be reached on 9:00-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ponnathapu Achutamurthy can be reached on 703-272-0928. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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